

	Type	L #	Hits	Search Text	DBs
1	BRS	L1	39	(search\$3 quer\$3 retriev\$3) same cach\$3 same (reus\$3 AND count\$3 AND quer\$3)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
2	BRS	L2	3910	((search\$3 OR query OR queries OR brows\$3 OR retriev\$3) SAME optimiz\$3) AND (cache\$1 OR (temporar\$4 SAME storage\$1)) AND ((access\$3 OR visit\$3 OR retriev\$3) SAME (count\$3 OR number\$1))	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
3	BRS	L3	1282	((search\$3 OR query OR queries OR brows\$3 OR retriev\$3) same optimiz\$3) AND (cache\$1 OR (temporar\$3 SAME storage\$1)) same ((access\$3 OR visit\$3 OR retriev\$3) same (count\$3 OR number\$1))	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B

	Type	L #	Hits	Search Text	DBs
4	BRS	L4	108	((search\$3 OR query OR queries OR brows\$3 OR retriev\$3) SAME optimiz\$3) same (cache\$1 OR (temporar\$3 SAME storage\$1)) same ((access\$3 OR visit\$3 OR retriev\$3) same (count\$3 OR number\$1)) AND (threshold\$1 OR condition\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
5	BRS	L5	108	3 and 4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
6	BRS	L6	108	2 and 5	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B

	Type	L #	Hits	Search Text	DBs
7	BRS	L7	14	2 and 1	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
8	BRS	L10	137	"707/10.ccls. and ((search\$3 OR query OR queries OR brows\$3 OR retriev\$3) SAME optimiz\$3) AND (cache\$1 OR (temporar\$3 SAME storage\$1)) AND ((access\$3 OR visit\$3 OR retriev\$3) SAME (count\$3 OR number\$1)) AND (threshold\$1 OR condition\$1) AND (reset\$3 OR reinitialz\$3 OR re-initializ\$3 OR initial OR defaut\$1)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
9	BRS	L11	78	"707"/104.1.ccls. and ((search\$3 OR query OR queries OR brows\$3 OR retriev\$3) SAME optimiz\$3) AND (cache\$1 OR (temporar\$3 SAME storage\$1)) AND ((access\$3 OR visit\$3 OR retriev\$3) SAME (count\$3 OR number\$1)) AND (threshold\$1 OR condition\$1) AND (reset\$3 OR reinitialz\$3 OR re-initializ\$3 OR initial OR defaut\$1)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B

	Type	L #	Hits	Search Text	DBs
10	BRS	L12	10567	(search\$3 same cach\$3)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
11	BRS	L13	13	(search\$3 same cach\$3) same count\$3 same threshold\$1	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
12	BRS	L14	2964	709/201-203.ccls. and (search\$3 quer\$3 retriev\$3) and cach\$3	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B

	Type	L #	Hits	Search Text	DBs
13	BRS	L15	7	709/201-203.ccls. and (search\$3 quer\$3 retriev\$3) and cach\$3 and (reus\$3 same count\$1)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
14	BRS	L16	6	709/217-219.ccls. and (search\$3 quer\$3 retriev\$3) and cach\$3 and (reus\$3 same count\$1)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
15	BRS	L17	1	715/501.1.ccls. and (search\$3 quer\$3 retriev\$3) and cach\$3 and (reus\$3 same count\$1)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B

	Type	L #	Hits	Search Text	DBs
16	BRS	L18	1	715/513.ccls. and (search\$3 quer\$3 retriev\$3) and cach\$3 and (reus\$3 same count\$1)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
17	BRS	L20	3	(web same (search adj engine\$1)) and cach\$3 and (reus\$3 same count\$1)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
18	BRS	L22	17	quer\$3 and (web and (search adj engine\$1)) and cach\$3 and (reus\$3 same count\$1)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B

	Type	L #	Hits	Search Text	DBs
19	BRS	L23	1	((search\$3 retriev\$3 quer\$3) with (condition\$1 criteria)) and (cach\$3 with (quer\$3 near result\$1)) and (reus\$3 same count\$1)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
20	BRS	L24	174	((search\$3 retriev\$3 quer\$3) with (condition\$1 criteria)) and (cach\$3 with (quer\$3 near result\$1))	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
21	BRS	L26	182	707/3,10.ccls. and ((search\$3 OR query OR queries OR brows\$3 OR retriev\$3) same optimiz\$3) AND (cache\$1 OR (temporar\$3 SAME storage\$1)) same ((access\$3 OR visit\$3 OR retriev\$3) same (count\$3 OR number\$1))	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B

	Type	L #	Hits	Search Text	DBs
22	BRS	L29	4	711/135.ccls. and ((search\$3 OR query OR queries OR brows\$3 OR retriev\$3) same optimiz\$3) AND (cache\$1 OR (temporar\$3 SAME storage\$1)) same ((access\$3 OR visit\$3 OR retriev\$3) same (count\$3 OR number\$1))	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B
23	BRS	L30	27	711/113.ccls. and ((search\$3 OR query OR queries OR brows\$3 OR retriev\$3) same optimiz\$3) AND (cache\$1 OR (temporar\$3 SAME storage\$1)) same ((access\$3 OR visit\$3 OR retriev\$3) same (count\$3 OR number\$1))	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWEN T; IBM_TD B





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## 1 [A comprehensive project for CS2: combining key data structures and algorithms into integrated web browser and search engine](#)



Tia Newhall, Lisa Meeden

February 2002 **ACM SIGCSE Bulletin , Proceedings of the 33rd SIGCSE technical symposium on Computer science education SIGCSE '02**, Volume 34 Is**Publisher:** ACM PressFull text available: [pdf\(450.67 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citi](#)

We present our experience using a large, real-world application as a course project for the second half of the semester of a CS2 course. Our primary goal for the project was to create an engaging application that incorporated most of the key data structures and algorithms introduced in the course. Specifically, the project uses binary search trees, priority queues, hash tables, and graphs. The project consisted of four parts combined to build an integrated web browser and search engine in Java. ...

## 2 [Reusable software components](#)



Trudy Levine

September 2005 **ACM SIGAda Ada Letters**, Volume XXV Issue 3**Publisher:** ACM PressFull text available: [pdf\(148.33 KB\)](#)Additional Information: [full citation](#), [abstract](#), [index terms](#)

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## 3 [Ada software reuse: Reusable software components](#)



Trudy Levine

August 2006 **ACM SIGAda Ada Letters**, Volume XXVI Issue 2**Publisher:** ACM PressFull text available: [pdf\(101.52 KB\)](#)Additional Information: [full citation](#), [abstract](#), [index terms](#)

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#### 4 Reusable software components



Trudy Levine

June 2005 **ACM SIGAda Ada Letters**, Volume XXV Issue 2

**Publisher:** ACM Press

Full text available: [pdf\(109.11 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [index terms](#)

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#### 5 Reusable software components



Trudy Levine

March 2005 **ACM SIGAda Ada Letters**, Volume XXV Issue 1

**Publisher:** ACM Press

Full text available: [pdf\(133.07 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [index terms](#)

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#### 6 Customizing information capture and access



Daniela Rus, Devika Subramanian

January 1997 **ACM Transactions on Information Systems (TOIS)**, Volume 15 Issue 1

**Publisher:** ACM Press

Full text available: [pdf\(1.26 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

This article presents a customizable architecture for software agents that capture and access information in large, heterogeneous, distributed electronic repositories. The key idea is to exploit underlying structure at various levels of granularity to build high-level indices with task-specific interpretations. Information agents construct such indices and are configured a network of reusable modules called structure detectors and segmenters. We illustrate the architecture ...

**Keywords:** information gathering, software agents, table recognition

#### 7 The V-Way Cache: Demand Based Associativity via Global Replacement



Moinuddin K. Qureshi, David Thompson, Yale N. Patt

May 2005 **ACM SIGARCH Computer Architecture News , Proceedings of the 32nd Annual International Symposium on Computer Architecture ISCA '05**, Volume 33 Issue 2

**Publisher:** IEEE Computer Society, ACM Press

Full text available: [pdf\(231.93 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [index terms](#)

As processor speeds increase and memory latency becomes more critical, intelligent design and management of secondary caches becomes increasingly important. The efficiency of current set-associative caches is reduced because programs exhibit a non-uniform distribution of memory accesses across different cache sets. We propose a technique to vary the

associativity of a cache on a per-set basis in response to the demands of the program. B increasing the number of tag-store entries relative to the ...

## 8 Web search 2: Detecting dominant locations from search queries

◆ Lee Wang, Chuang Wang, Xing Xie, Josh Forman, Yansheng Lu, Wei-Ying Ma, Ying Li  
August 2005 **Proceedings of the 28th annual international ACM SIGIR conference  
Research and development in information retrieval SIGIR '05**

**Publisher:** ACM Press

Full text available:  [pdf\(290.97 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citation index terms](#)

Accurately and effectively detecting the locations where search queries are truly about has a huge potential impact on increasing search relevance. In this paper, we define a search query's dominant location (QDL) and propose a solution to correctly detect it. QDL is geographical location(s) associated with a query in collective human knowledge, i.e., one or few prominent locations agreed by majority of people who know the answer to the query is a subjective and collective attribute of search ...

**Keywords:** information retrieval, local search, query's dominant location, search, search query location, search relevance

## 9 Learning source-target surface patterns for web-based terminology translation

Jian-Cheng Wu, Tracy Lin, Jason S. Chang

June 2005 **Proceedings of the ACL 2005 on Interactive poster and demonstration sessions ACL '05**

**Publisher:** Association for Computational Linguistics

Full text available:  [pdf\(115.84 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)


This paper introduces a method for learning to find translation of a given source term on Web. In the approach, the source term is used as query and part of patterns to retrieve and extract translations in Web pages. The method involves using a bilingual term list to learn source-target surface patterns. At runtime, the given term is submitted to a search engine then the candidate translations are extracted from the returned summaries and subsequently ranked based on the surface patterns, etc ...

## 10 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research CASCON '97**

**Publisher:** IBM Press

Full text available:  [pdf\(4.21 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of an application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeat occurrences of non-trivial communication ...

**11 GPGPU: general purpose computation on graphics hardware**

 David Luebke, Mark Harris, Jens Krüger, Tim Purcell, Naga Govindaraju, Ian Buck, Cliff Wootton, Aaron Lefohn

August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

**Publisher:** ACM Press

Full text available:  pdf(63.03 MB)

Additional Information: [full citation](#), [abstract](#), [citations](#)


The graphics processor (GPU) on today's commodity video cards has evolved into an extremely powerful and flexible processor. The latest graphics architectures provide tremendous memory bandwidth and computational horsepower, with fully programmable vertex and pixel processing units that support vector operations up to full IEEE floating point precision. High level languages have emerged for graphics hardware, making this computational power accessible. Architecturally, GPUs are highly parallel s ...

**12 Search engineering 1: What's new on the web?: the evolution of the web from a search engine perspective**

 Alexandros Ntoulas, Junghoo Cho, Christopher Olston

May 2004 **Proceedings of the 13th international conference on World Wide Web WWW '04**

**Publisher:** ACM Press

Full text available:  pdf(502.41 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We seek to gain improved insight into how Web search engines should cope with the evolution of the Web, in an attempt to provide users with the most up-to-date results possible. For this purpose we collected weekly snapshots of some 150 Web sites over the course of one year, and measured the evolution of content and link structure. Our measurements focus on aspects of potential interest to search engine designers: the evolution of link structure over time, the rate of creation of new pages and new distinct c ...



**Keywords:** change prediction, degree of change, link structure evolution, rate of change, search engines, web characterization, web evolution, web pages

**13 Technical papers: component technologies: Component rank: relative significance ranking for software component search**

Katsuro Inoue, Reishi Yokomori, Hikaru Fujiwara, Tetsuo Yamamoto, Makoto Matsushita, Shiro Kusumoto

May 2003 **Proceedings of the 25th International Conference on Software Engineering ICSE '03**

**Publisher:** IEEE Computer Society

Full text available:  pdf(884.54 KB)  [Publisher Site](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Collections of already developed programs are important resources for efficient development of reliable software systems. In this paper, we propose a novel method of ranking software components, called *Component Rank*, based on analyzing actual use relations among the components and propagating the significance through the use relations. We have developed a component-rank computation system, and applied it to various Java programs. The results

promising such that non-specific and generic ...

#### 14 Boosting the performance of Web search engines: Caching and prefetching query results by exploiting historical usage data



Tiziano Fagni, Raffaele Perego, Fabrizio Silvestri, Salvatore Orlando

January 2006 **ACM Transactions on Information Systems (TOIS)**, Volume 24 Issue 1

**Publisher:** ACM Press

Full text available: pdf(668.69 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This article discusses efficiency and effectiveness issues in caching the results of queries submitted to a Web search engine (WSE). We propose SDC (Static Dynamic Cache), a new caching strategy aimed to efficiently exploit the temporal and spatial locality present in the stream of processed queries. SDC extracts from historical usage data the results of the most frequently submitted queries and stores them in a *static, read-only* portion of the cache. The remaining entries of the cache ...

**Keywords:** Caching, Web search engines, multithreading

#### 15 Computing curricula 2001



September 2001 **Journal on Educational Resources in Computing (JERIC)**

**Publisher:** ACM Press

Full text available: pdf(613.63 KB) html (2.78 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

#### 16 Query term disambiguation for Web cross-language information retrieval using a search engine



Akira Maeda, Fatiha Sadat, Masatoshi Yoshikawa, Shunsuke Uemura

November 2000 **Proceedings of the fifth international workshop on on Information retrieval with Asian languages IRAL '00**

**Publisher:** ACM Press

Full text available: pdf(736.31 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

With the worldwide growth of the Internet, research on Cross-Language Information Retrieval (CLIR) is being paid much attention. Existing CLIR approaches based on query translation require parallel corpora or comparable corpora for the disambiguation of translated query terms. However, those natural language resources are not readily available. In this paper we propose a disambiguation method for dictionary-based query translation that is independent of the availability of such scarce language resources ...

**Keywords:** WWW, cross-language information retrieval, mutual information, search engines

#### 17 Search engine engineering: To randomize or not to randomize: space optimal summaries for hyperlink analysis

-  Tamás Sarlós, Adrás A. Benczúr, Károly Csalogány, Dániel Fogaras, Balázs Rác  
 May 2006 **Proceedings of the 15th international conference on World Wide Web W**  
**'06**

**Publisher:** ACM Press

Full text available:  [pdf\(301.26 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Personalized PageRank expresses link-based page quality around user selected pages. The only previous personalized PageRank algorithm that can serve on-line queries for an unrestricted choice of pages on large graphs is our Monte Carlo algorithm [WAW 2004]. In this paper we achieve unrestricted personalization by combining rounding and randomized sketching techniques in the dynamic programming algorithm of Jeh and Widom [WWW 2004]. We evaluate the precision of approximation experimentally on large graphs.

**Keywords:** data streams, link-analysis, scalability, similarity search

## 18 Aggregate predicate support in DBMS

Apostol (Paul) Natsev, Gene Y. C. Fuh, Weidong Chen, Chi-Huang Chiu, Jeffrey S. Vitter  
 January 2002 **Australian Computer Science Communications , Proceedings of the 15th Australasian database conference - Volume 5 ADC '02**, Volume 24 Issue 1

**Publisher:** Australian Computer Society, Inc., IEEE Computer Society Press

Full text available:  [pdf\(1.57 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citation index terms](#)

In this paper we consider aggregate predicates and their support in database systems. Aggregate predicates are the predicate equivalent to aggregate functions in that they can be used to search for tuples that satisfy some aggregate property over a set of tuples (as opposed to simply computing an aggregate property over a set of tuples). The importance of aggregate predicates is exemplified by many modern applications that require ranked set or top-*k* queries. Such queries are the norm ...

**Keywords:** aggregate predicates, nearest neighbor, query optimization

## 19 OOPSLA onward! track: No name: just notes on software reuse

 Robert Biddle, Angela Martin, James Noble  
 December 2003 **ACM SIGPLAN Notices**, Volume 38 Issue 12

**Publisher:** ACM Press

Full text available:  [pdf\(2.62 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citation index terms](#)

In the beginning, so our myths and stories tell us, the programmer created the program to escape the eternal nothingness of the void. In this essay, we recognise that programs these days are like any other assemblage, and suggest that in fact programming has always been about reuse. We also explore the nature of reuse, and claim that Components themselves are the most important consideration for reuse; it is the end product, the composition. The process still involves value, investment, and return. ...

**Keywords:** components, object-oriented programming, software reuse

**20** Onward papers: No name: just notes on software reuse

Robert Biddle, Angela Martin, James Noble

October 2003 **Companion of the 18th annual ACM SIGPLAN conference on Object-oriented programming, systems, languages, and applications OOPSLA '03****Publisher:** ACM PressFull text available: [pdf\(1.81 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In the beginning, so our myths and stories tell us, the programmer created the program the eternal nothingness of the void. In this essay, we recognise that programs these day like any other assemblage, and suggest that in fact programming has always been about reuse. We also explore the nature of reuse, and claim that Components themselves are the most important consideration for reuse; it is the end product, the composition. The is still involve value, investment, and return. ...

**Keywords:** components, object-oriented programming, software reuse

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## 1 [Indexing and querying: Three-level caching for efficient query processing in large Web search engines](#)



Xiaohui Long, Torsten Suel

May 2005 **Proceedings of the 14th international conference on World Wide Web W '05****Publisher:** ACM PressFull text available: [pdf\(243.61 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citation index terms](#)

Large web search engines have to answer thousands of queries per second with interactive response times. Due to the sizes of the data sets involved, often in the range of multiple terabytes, a single query may require the processing of hundreds of megabytes or more index data. To keep up with this immense workload, large search engines employ clusters of hundreds or thousands of machines, and a number of techniques such as caching, index compression, and index and query pruning are used to improve performance.

**Keywords:** Web search, caching, inverted index

## 2 [Information Retrieval: Predictive caching and prefetching of query results in search engines](#)



Ronny Lempel, Shlomo Moran

May 2003 **Proceedings of the 12th international conference on World Wide Web W '03****Publisher:** ACM PressFull text available: [pdf\(212.73 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citation index terms](#)

We study the caching of query result pages in Web search engines. Popular search engines receive millions of queries per day, and efficient policies for caching query results may enable them to lower their response time and reduce their hardware requirements. We present (probability driven cache), a novel scheme tailored for caching search results, that is based on a probabilistic model of search engine users. We then use a trace of over seven million queries submitted to the search engine A ...

**Keywords:** caching, query processing and optimization



### 3 Boosting the performance of Web search engines: Caching and prefetching query results by exploiting historical usage data



Tiziano Fagni, Raffaele Perego, Fabrizio Silvestri, Salvatore Orlando

January 2006 **ACM Transactions on Information Systems (TOIS)**, Volume 24 Issue 1

**Publisher:** ACM Press

Full text available: [pdf\(668.69 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This article discusses efficiency and effectiveness issues in caching the results of queries submitted to a Web search engine (WSE). We propose SDC (Static Dynamic Cache), a new caching strategy aimed to efficiently exploit the temporal and spatial locality present in the stream of processed queries. SDC extracts from historical usage data the results of the most frequently submitted queries and stores them in a *static, read-only* portion of the cache. The remaining entries of the cache are dynamically updated.

**Keywords:** Caching, Web search engines, multithreading

### 4 Rank-preserving two-level caching for scalable search engines



Paricia Correia Saraiva, Edleno Silva de Moura, Novio Ziviani, Wagner Meira, Rodrigo Fonseca Berthier Riberio-Neto

September 2001 **Proceedings of the 24th annual international ACM SIGIR conference on Research and development in information retrieval SIGIR '01**

**Publisher:** ACM Press

Full text available: [pdf\(232.50 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

### 5 Querying and web: Efficient query processing in geographic web search engines



Yen-Yu Chen, Torsten Suel, Alexander Markowetz

June 2006 **Proceedings of the 2006 ACM SIGMOD international conference on Management of data SIGMOD '06**

**Publisher:** ACM Press

Full text available: [pdf\(296.76 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Geographic web search engines allow users to constrain and order search results in an intuitive manner by focusing a query on a particular geographic region. Geographic search technology, also called *local search*, has recently received significant interest from major search engine companies. Academic research in this area has focused primarily on techniques for extracting geographic knowledge from the web. In this paper, we study the problem of efficient query processing in scalable geographic search engines.


### 6 Optimizing result prefetching in web search engines with segmented indices



Ronny Lempel, Shlomo Moran

February 2004 **ACM Transactions on Internet Technology (TOIT)**, Volume 4 Issue 1

**Publisher:** ACM Press

Full text available:  [pdf\(183.97 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citation index terms](#)

We study the process in which search engines with segmented indices serve queries. In particular, we investigate the number of result pages that search engines should prepare during the query processing phase. Search engine users have been observed to browse through very few pages of results for queries that they submit. This behavior of users suggests that prefetching many results upon processing an initial query is not efficient, since most of the prefetched results will not be requested by the ...

**Keywords:** Distributed inverted indices, prefetching, search engines

## 7 Inverted files for text search engines



Justin Zobel, Alistair Moffat

July 2006 **ACM Computing Surveys (CSUR)**, Volume 38 Issue 2

**Publisher:** ACM Press

Full text available:  [pdf\(944.29 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The technology underlying text search engines has advanced dramatically in the past decade. The development of a family of new index representations has led to a wide range of innovations in index storage, index construction, and query evaluation. While some of these developments have been consolidated in textbooks, many specific techniques are not well known or the textbook descriptions are out of date. In this tutorial, we introduce the key techniques in the area, describing both a core implementation ...

**Keywords:** Inverted file indexing, Web search engine, document database, information retrieval, text retrieval

## 8 Research session: DB and IR #1: An efficient and versatile query engine for TopX search

Martin Theobald, Ralf Schenkel, Gerhard Weikum

August 2005 **Proceedings of the 31st international conference on Very large data bases VLDB '05**

**Publisher:** VLDB Endowment

Full text available:  [pdf\(442.21 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citation index terms](#)

This paper presents a novel engine, coined *TopX*, for efficient ranked retrieval of XML documents over semistructured but nonschematic data collections. The algorithm follows the paradigm of threshold algorithms for top-k query processing with a focus on inexpensive sequential accesses to index lists and only a few judiciously scheduled random accesses. The difficulties in applying the existing top-k algorithms to XML data lie in 1) the need to compute scores for XML elements while aggregating ...

## 9 Coverage, relevance, and ranking: The impact of query operators on Web search engine results



Caroline M. Eastman, Bernard J. Jansen


October 2003 **ACM Transactions on Information Systems (TOIS)**, Volume 21 Issue 4

**Publisher:** ACM Press

Full text available:  [pdf\(373.50 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citation index terms](#), [review](#)

Research has reported that about 10% of Web searchers utilize advanced query operators, with the other 90% using extremely simple queries. It is often assumed the use of query operators, such as Boolean operators and phrase searching, improves the effectiveness of Web searching. We test this assumption by examining the effects of query operators on the performance of three major Web search engines. We selected one hundred queries from the transaction log of a Web search service ...

**Keywords:** Boolean operators, Relative precision, Web results, coverage, query operator ranking, search engines


- 10** [Browsers and UI, web engineering, hypermedia & multimedia, security, and accessibility: Efficient query subscription processing for prospective search engines](#)  
 Utku Irmak, Svilen Mihaylov, Torsten Suel, Samrat Ganguly, Rauf Izmailov  
May 2006 **Proceedings of the 15th international conference on World Wide Web W '06**

**Publisher:** ACM Press

Full text available:  [pdf\(88.44 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Current web search engines are retrospective in that they limit users to searches against already existing pages. Prospective search engines, on the other hand, allow users to up queries that will be applied to newly discovered pages in the future. We study and compare algorithms for efficiently matching large numbers of simple keyword queries against a set of newly discovered pages.

**Keywords:** inverted index, prospective search, query processing


- 11** [Industrial session: Secure search in enterprise webs: tradeoffs in efficient implementation for document level security](#)  
 Peter Bailey, David Hawking, Brett Matson  
November 2006 **Proceedings of the 15th ACM international conference on Information and knowledge management CIKM '06**

**Publisher:** ACM Press

Full text available:  [pdf\(538.46 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


Document level security (DLS) -- enforcing permissions prevailing at the time of search -- specified as a mandatory requirement in many enterprise search applications. Unfortunately, depending upon implementation details and values of key parameters, DLS may come at a high price in increased query processing time, leading to an unacceptably slow search experience. In this paper we present a model and a method for carrying out secure search in the presence of DLS within enterprise webs. We report ...

**Keywords:** access control, caching, collection level security, document level security, enterprise search, file systems, performance, scalability, security models

**12 Best Paper: Early experiences with a 3D model search engine** Patrick Min, John A. Halderman, Michael Kazhdan, Thomas A. FunkhouserMarch 2003 **Proceeding of the eighth international conference on 3D Web technology Web3D '03****Publisher:** ACM PressFull text available:  [pdf\(1.92 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citation index terms](#)

New acquisition and modeling tools make it easier to create 3D models, and affordable and powerful graphics hardware makes it easier to use them. As a result, the number of 3D models available on the web is increasing rapidly. However, it is still not as easy to find 3D models as it is to find, for example, text documents and images. What is needed is a "3D model search engine," a specialized search engine that targets 3D models. We created a prototype 3D model search engine to investigate the design and implementation of such an engine.

**Keywords:** 3D model database, shape matching, shape query interfaces, specialized search engine

**13 Research papers: XML query, update, and search: Efficient keyword search for smallest LCA in XML databases** Yu Xu, Yannis PapakonstantinouJune 2005 **Proceedings of the 2005 ACM SIGMOD international conference on Management of data SIGMOD '05****Publisher:** ACM PressFull text available:  [pdf\(479.45 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citation index terms](#)

Keyword search is a proven, user-friendly way to query HTML documents in the World Wide Web. We propose keyword search in XML documents, modeled as labeled trees, and design corresponding efficient algorithms. The proposed keyword search returns the set of smallest trees containing all keywords, where a tree is designated as "smallest" if it contains no proper subtree that also contains all keywords. Our core contribution, the Indexed Lookup Eager algorithm, exploits key properties of smallest trees in XML.

**14 Research sessions: Research 28: Search applications: Trustworthy keyword search for regulatory-compliant records retention**

Soumyadeb Mitra, Windsor W. Hsu, Marianne Winslett

September 2006 **Proceedings of the 32nd international conference on Very large databases - Volume 32 VLDB'2006****Publisher:** VLDB EndowmentFull text available:  [pdf\(879.26 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Recent litigation and intense regulatory focus on secure retention of electronic records has spurred a rush to introduce Write-Once-Read-Many (WORM) storage devices for retaining business records such as electronic mail. However, simply storing records in WORM storage is insufficient to ensure that the records are trustworthy, i.e., able to provide irrefutable proof and accurate details of past events. Specifically, some form of index is needed for timely access to the records, but unless the index is trustworthy, the records are not trustworthy.

15 A comprehensive project for CS2: combining key data structures and algorithms into an integrated web browser and search engine



Tia Newhall, Lisa Meeden

February 2002 **ACM SIGCSE Bulletin , Proceedings of the 33rd SIGCSE technical symposium on Computer science education SIGCSE '02**, Volume 34 Issue 1

**Publisher:** ACM Press

Full text available: pdf(450.67 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

We present our experience using a large, real-world application as a course project for the second half of the semester of a CS2 course. Our primary goal for the project was to create an engaging application that incorporated most of the key data structures and algorithms introduced in the course. Specifically, the project uses binary search trees, priority queues, hash tables, and graphs. The project consisted of four parts combined to build an integrated web browser and search engine in Java. ...

16 Automated gathering of Web information: An in-depth examination of agents interacting with search engines



Bernard J. Jansen, Tracy Mullen, Amanda Spink, Jan Pedersen

November 2006 **ACM Transactions on Internet Technology (TOIT)**, Volume 6 Issue 4

**Publisher:** ACM Press

Full text available: pdf(386.13 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The Web has become a worldwide repository of information which individuals, companies, organizations utilize to solve or address various information problems. Many of these Web users utilize automated agents to gather this information for them. Some assume that this approach represents a more sophisticated method of searching. However, there is little research investigating how Web agents search for online information. In this research, we first provide a classification for information agents ...

**Keywords:** Search engines, Web searching, agent searching

17 Indexing and querying: Improving Web search efficiency via a locality based static pruning method



Edleno S. de Moura, Célia F. dos Santos, Daniel R. Fernandes, Altigran S. Silva, Pavel Calais Mario A. Nascimento

May 2005 **Proceedings of the 14th international conference on World Wide Web WWW '05**

**Publisher:** ACM Press

Full text available: pdf(175.01 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The unarguably fast, and continuous, growth of the volume of indexed (and indexable) documents on the Web poses a great challenge for search engines. This is true regarding not only search effectiveness but also time and space efficiency. In this paper we present an index pruning technique targeted for search engines that addresses the latter issue without disconsidering the former. To this effect, we adopt a new pruning strategy capable of greatly reducing the size of search engine indices. Exp ...


**Keywords:** indexing, information retrieval, pruning, search engines, web search

### 18 A search engine for 3D models

◆ Thomas Funkhouser, Patrick Min, Michael Kazhdan, Joyce Chen, Alex Halderman, David Dol  
David Jacobs

January 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 1

**Publisher:** ACM Press

Full text available:  pdf(7.91 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citi](#)  
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As the number of 3D models available on the Web grows, there is an increasing need for search engine to help people find them. Unfortunately, traditional text-based search techniques are not always effective for 3D data. In this article, we investigate new shape based search methods. The key challenges are to develop query methods simple enough novice users and matching algorithms robust enough to work for arbitrary polygonal mo We present a Web-based search engine system that support ...

**Keywords:** Search engine, shape matching, shape representation, shape retrieval

### 19 Dynamic services and analysis: Make it fresh, make it quick: searching a network of personal webservers

◆ Mayank Bawa, Roberto J. Bayardo, Sridhar Rajagopalan, Eugene J. Shekita

May 2003 **Proceedings of the 12th international conference on World Wide Web W**  
**'03**

**Publisher:** ACM Press

Full text available:  pdf(500.28 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citi](#)  
[index terms](#)

Personal webservers have proven to be a popular means of sharing files and peer collaboration. Unfortunately, the transient availability and rapidly evolving content on su hosts render centralized, crawl-based search indices stale and incomplete. To address th problem, we propose YouSearch, a distributed search application for personal webserver operating within a shared context (e.g., a corporate intranet). With YouSearch, search re are always fast, fresh and complete -- properties we ...

**Keywords:** P2P, decentralized systems, information communities, intranet search, peer peer networks, web search

### 20 Teaching key topics in computer science and information systems through a web se engine project

◆ Michael Chau, Zan Huang, Hsinchun Chen

September 2003 **Journal on Educational Resources in Computing (JERIC)**, Volume 3  
3

**Publisher:** ACM Press

Full text available:  pdf(169.15 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [ind](#)  
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Advances in computer and Internet technologies have made it more and more important information technology professionals to acquire experience in a variety of aspects, including new technologies, system integration, database administration, and project management. To provide students with a chance to acquire such skills, we designed a project called "Build Search Engine in 90 Days," in which students were required to build a domain-specific Web search engine in a semester. In this pa ...

**Keywords:** education, indexing, web computing, web search engine, web spiders

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